

## Forensic Science | 7.1 Arson and Explosives Assignment

Your certification exam is coming up next week to renew your credentials as an Arson and Explosives expert. Your supervisor has implied that you may be up for a promotion upon attaining a superior score on the certification exam. You would love a promotion with a new title and salary, so you created a study guide for yourself for the concepts you need to focus on the most for the exam. Complete the study guide below so that you are ready for anything the exam throws at you!

In each of the scenarios listed below, answer the analysis questions. (1 point each unless noted)

### Scenario 1

At the scene of a house fire, you observe the following characteristics:

- More than one point of origin
- Ribbon shaped fire patterns from the point of origin
- “Alligator skin” crackling patterns on walls and floor
- Melted glass
- Buckled Steel beams
- Matchbook found in bushes near house
- Burned, but recognizable gas can be found near a back door

1. Are these characteristics indicative of a natural fire, accidental fire, or arson?

Arson

2. Explain how EACH of the characteristics above indicate the type of fire you identified in #1.

More than one point of origin means that the arsonist set multiple fires. Ribbon shaped fire patterns show that the fire was lead to different areas on purpose instead of spreading naturally. Alligator skin indicates the fire burned faster than normal. Melted glass and buckled steel beams indicate that the fire was very hot. The matchbook is an incendiary device used to start the fire. The presence of gas indicates that the arsonist used gas to spread the fire.

3. Why is it important to have a person specifically trained in arson to investigate the scene if arson is suspected?

Because it is very important for them to know the signs of an arson.

4. What is the proper procedure for collecting suspected arson evidence?

Collect it and store it in airtight containers.

5. How is a piece of charred wood tested for the presence or accelerants?

Olfactory detection

6. How sensitive is this method?

10000 times more sensitive than taste

7. Name and describe the three parts of the fire triangle.

Oxygen fire needs oxygen to burn. Fuel is the stuff that is being combined with oxygen when it is burned. Heat is what allows the reaction to happen.

8. Name 3 common accelerants used in arson. **Gasoline, Lighter fluid, Kerosene**
9. Research and report here about 1 famous arson case. Give a brief summary of the case details. (2 points)  
**In the early 1980s, 9 men, including 3 Boston police officers, burned 264 buildings in Boston Massachusetts due to tax cuts that lead to police and firemen being laid off.**

## Scenario 2 (10 points)

You are called to the scene of an explosion on the 4<sup>th</sup> of July. You observe the following characteristics:

- The area where the explosion occurred is extensively damaged.
- Windows shattered in nearby homes by flying debris.
- A debris pile that appears to contain multiple nails and screws.
- Shrapnel and screws lodged in the wood siding of a nearby home.
- Witnesses reported hearing a very loud explosive sound at the time of the explosion. It was reportedly much louder than anything they had heard before.
- The remains of what appears to be a mangled and badly damaged metal briefcase are found near the explosion site.
- A second similar, undamaged briefcase is found a short distance from the location of the original explosion.

1. Do you feel that this explosion was due to fireworks, a drug lab explosion, gas main leak, or a bomb? What clues lead you to this conclusion?

**Bomb. The explosion was very loud and there were nails in it. The other briefcase is probably a second bomb.**

2. What is the first step that must be done before anyone enters the explosion site?

**Secure the second bomb**

3. Is this characteristic of a low or high explosive?

**High**

4. How should the second (undamaged) briefcase be approached?

**Cautiously**

5. How is evidence collected in an explosion case?

**swabbing**

6. What tool is used in an explosion site to chemically detect explosive residues on objects?

**Explosives trace detector**

7. What methods are used to analyze evidence from explosions?

**Chromatography**

8. If the explosion is terrorist related, where is the evidence sent for evaluation?

**The Terrorist Explosive Device Analytical Center**

9. Research and report here about 1 famous case involving an explosion. Give a brief summary of the case. (2 points)

**On April 15, 2013, two pressure cooker bombs were detonated near the finish line of the Boston marathon. They went off 14 seconds apart. 281 people were injured and 3 were killed.**